

*For the SPE  
reference only.*

### REMARKS

Claims 1, 2, 5, 8-16, 43-46, 49-56 and 60 are rejected under 35 U.S.C. 103a as being unpatentable over U.S. Patent No. 5,753,911 to Yasuda et al. in view of U.S. Patent 5,969,848 to Lee et al. Some of the rejected claims have been amended, and the rejection is respectfully traversed insofar as it is deemed to apply to the claims as amended.

The Examiner is of the opinion that Yasuda discloses in FIG. 10 a stator comprising a first plurality of fingers 703, a rotor 706 and 707 formed in the layer comprising a second plurality of fingers, wherein one or more of the fingers of the second plurality is between the fingers of the first plurality. We respectfully disagree. As clearly shown in FIG. 10 of Yasuda, the first plurality of fingers 703 and the second plurality of fingers 706 are on different planes so that the second plurality of fingers 706 are not between the fingers of the first plurality 703. If the examiner disagrees, it is respectfully requested that the examiner point out in detail where in Fig. 10 or any other portion of Yasuda that such feature is shown.

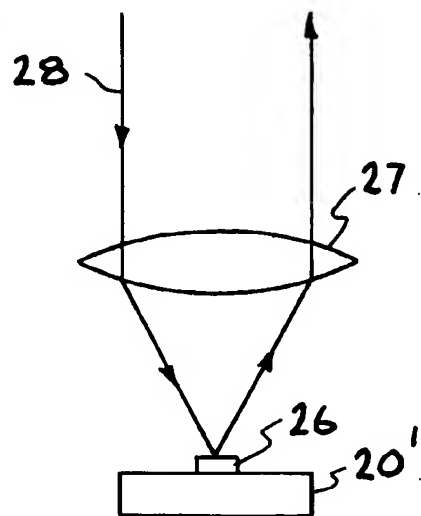
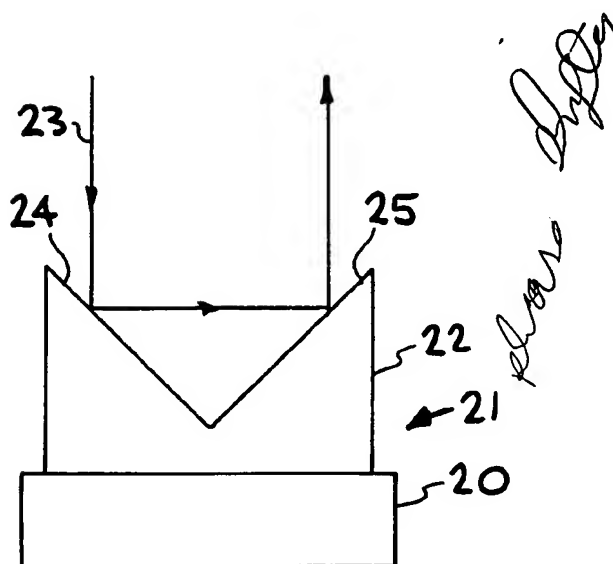
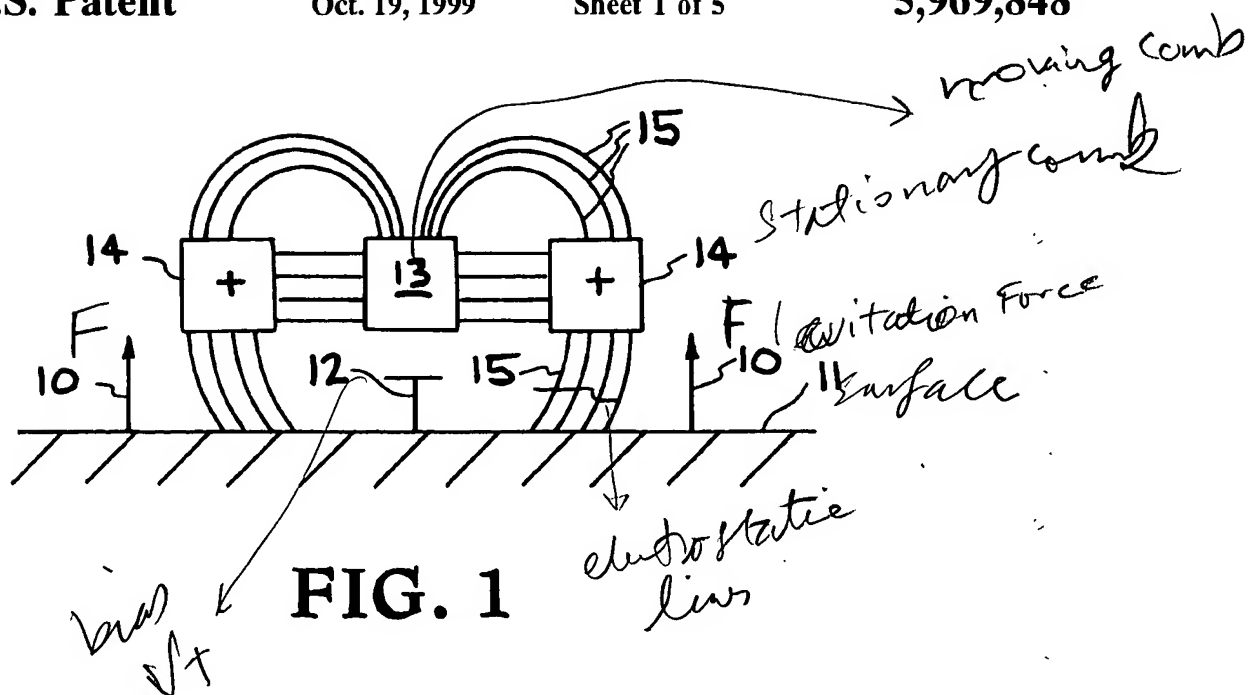
The Examiner admits that Yasuda does not disclose that the first and second plurality of fingers is substantially in a plane when no voltage is applied to the actuator, such plane being transverse to the direction of the vertical force. The Examiner, however, is of the opinion that Lee discloses such feature and that "It would have been obvious of one of ordinary skill in the art at the time of the invention to use inter-digitized fingers in Yasuda's structure to affect the driving force therein. We respectfully disagree.

The Examiner is further of the opinion that Yasuda teaches "one or more fingers of the rotor has a height less than or equal to one or more fingers of the stator, as can be seen in the figure, such that a vertical force is exerted upon the rotor, the height measured from the bottom of the finger to the top of the finger (see also Column 6, Lines 4-50, for an explanation of the figure)". We respectfully disagree. FIG. 10 and Column 6, Lines 4-50 of Yasuda do not show the feature that one or more fingers of the rotor has a height less than or equal to one or more fingers of the stator, the height measured from the

bottom of the finger to the top of the finger, contrary to the assertion by the Examiner. If the Examiner disagrees, it is respectfully requested that the Examiner explain in detail why such feature is disclosed in FIG. 10 or any other portion of Yasuda. Under MPEP 2125, when the reference does not disclose that the drawings are to scale and are silent as to dimensions, arguments based on measurement of the drawing features are of little value. Since Yasuda did not disclose that FIG. 10 is drawn to scale and is silent as to dimensions, arguments made by the Examiner based on measurement of the drawing features of FIG. 10 are of little or no value.

Yasuda describes a variation of what is known to those skilled in the art as a "parallel plate actuator." Like all parallel plate electrostatic actuators, Yasuda's device consists of two opposing conductors, made from two separate layers of material, which are attracted towards one another when biased to different electrical potentials. The electrostatic force is in a direction perpendicular to the opposing surfaces of the two electrodes. Yasuda happens to find it advantageous to pattern each of these two conductors into comb-shaped structures. Contrary to the Examiner's assertion, these are not interdigitated combs. Rather, these are merely comb-shaped structures located on two separate layers spaced apart from each other and do not alter the fundamental mode of operation of the actuator, which remains a parallel plate actuator. A parallel plate actuator operates by applying different electrical potentials to the parallel plates so that a force is applied to the plates in a direction perpendicular to the plates to pull them together or force them apart.

Lee, on the other hand, operates based on principles, which are totally different and have nothing to do with principles of operation of the parallel plate actuator of Yasuda. As clearly explained by Lee in Column 3, Lines 9-65, Lee's device relies on the use of levitation force. As explained by Lee in Column 3, the levitation force is caused by the asymmetric distribution of electric fields when a bias voltage is applied. As noted by Lee in Column 3, this levitation force is often the source of unwanted out-of-plane motion such as tilting in parallel plate actuators, which relies on an effect, which is non-linear in nature and has an unstable region of operation. This complicates the fabrication and control of parallel plate actuators. Because of its non-linear nature, measures need to be taken to prevent the plates of parallel plate actuators from collapsing as well as



shorting out. Lee is of the opinion that "The present invention, instead of attempting to suppress the above-described unwanted out-of-plane motion caused by the generated levitation force, utilizes this levitation force for controllable small vertical motions. (< 1.5  $\mu\text{m}$ )."

From the above, it appears that Lee considers his device using levitation force to be totally incompatible with the parallel plate type actuator of Yasuda. It is believed that one of ordinary skill in the art having read Yasuda and Lee, will be persuaded by Lee that the parallel plate type actuator of Yasuda and the levitation force type actuator of Lee are totally incompatible with one another so that one would not think of combining Yasuda with Lee as urged by the Examiner. In the office action, the Examiner has failed to provide any reason or motivation why one skilled in the art would combine the features of Lee with Yasuda. It is believed to be well settled that, before the teaching of two different references may be combined in an obviousness type rejection, there must be reason or motivation for the combination. The Examiner supplied none.

The Examiner's position appears to be contrary to the court's ruling in *In re Sang Su Lee*, 277 F.3d 1338, 61 U.S.P.Q.2d 1430 (Fed. Cir. Jan. 2002). In such case, the Federal Circuit, quoted *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999) as follows: "Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references." The Federal Circuit went on to state that "The need for specificity pervades this authority . . . . The Examiner's conclusory statements . . . do not adequately address the issue of motivation to combine. This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority." The Examiner has failed to supply any reason or motivation for the combination of Lee with Yasuda. The combination of such two references is therefore based only on subjective belief and unknown authority. As pointed out by the Federal Circuit in the *In re Sang Su Lee* case, under the Administrative Procedure Act, the Patent Office is required to develop an evidentiary basis for its findings and its omission is both legal error and arbitrary agency action. Therefore, the Examiner has failed to provide adequate evidentiary basis for its factual findings and failed to prove a *prima facie* case

of obviousness with respect to the rejected claims. As pointed out by the Federal Circuit, such omission is both legal error and arbitrary agency action.

The above argument applies both to Claims 1 and 60.

Claims 2-20 are believed to be allowable since they depend from allowable Claim 1.

The allowance of Claims 27-42 is noted with appreciation.

For substantially the same reasons as those explained for Claim 1 above, Claim 43 is also believed to be allowable; in connection therewith, it is noted that Claim 43 does not require that one or more fingers of the rotor has a height less than or equal to one or more fingers of the stator such that a vertical force is exerted upon the rotor, the height measured from the bottom of the finger to the top of the finger. Claims 44-60 are believed to be allowable since they depend from allowable Claim 43 and also because of the limitations in these claims.

Claims 17-20 are rejected under 35 U.S.C. 103a as being unpatentable over Yasuda in view of Lee as applied to Claim 16 above and further in view of U.S. Patent 6,538,284 to Riccobene. The rejection is respectfully traversed.

Riccobene describes a semiconductor-on-insulator device as a method for making transistor devices. Riccobene is, therefore, non-analogous art and should, therefore, be removed as a reference. A reference is non-analogous art if it is not within the field of endeavor of the invention of the rejected claim and not reasonably pertinent to the particular problem with which the inventors are involved. In re: Deminski 230 USPQ 313 at 315 (Fed. Cir. 1986). Being directed to the semiconductor-on-insulator devices, Riccobene is clearly not within the field of endeavor of rejected Claims 17-20, which pertain to an electrostatic actuator. The four rejected claims pertain to the construction of the electrostatic actuator, and in the case of Claims 18-20, they pertain to the construction of the stator and rotor where the rotor moves relative to the stator when the voltage is applied to the stator. Therefore, it is believed that Riccobene, which is concerned with device integrity of transistors, is also not reasonably pertinent to the particular problem with which the inventors are involved in the construction of the electrostatic actuator and in the construction of the stator and rotor. Therefore, Riccobene is non-analogous art and should be removed as a reference.

Even assuming arguendo that it is proper to consider Riccobene regarding Claims 17-20, there appears to be no reason or motivation for making the combination now urged by the Examiner. The Examiner is of the opinion that "saving the device integrity by appropriate isolation between the device components and the other components of adjacent devices/substrates" provides the reason or motivation for the combination. We respectfully disagree. The reasons cited by the Examiner pertain only to concerns particular to Riccobene, namely, device integrity of transistors. These concerns are totally irrelevant insofar as the electrostatic actuator of Claims 17-20 is concerned, and the examiner has failed to articulate why such considerations would provide reason or motivation for making the combination. Regarding Claims 17-20, it is the electrostatic properties of the various materials and insulating layers in Claims 17-20 that are relevant to the invention, not any device integrity that is irrelevant insofar as these claims are concerned. For example, for the electrostatic actuator, an insulating material can serve a function similar to a conducting material when they are at the same electrical potential, since this will result in the same electrostatic force. For transistors, they are radically different materials.


It is noted with appreciation that Claims 6, 7, 47, 48, 57- 59 would be allowable if rewritten in independent form. This has not been done since the claims upon which they depend are also believed to be allowable. In regard to the reason for the indication of allowability of Claims 6 and 7, we wish to point out that Claim 6 does not refer to or require an input signal and that Claim 7 does not require or refer to filter elements.

We continue to disagree with the Examiner on the reasons for allowance of Claims 27-42. For example, Claim 27 does not require that the insulating material of the rotor and stator be coplanar when no voltage is applied. In Claim 27, the rotor is formed in the second conductive layer and not in the "second conductive/insulating layer." Claim 34 also does not require that the insulating layer of the rotor and stator be coplanar when no voltage is applied. In Claim 34, the rotator is formed in the insulating layer and not in the "conductive/insulating layer." The above reasons indicated by the Examiner do not appear to apply to Claim 57 at all. Claim 40 does not require that a rotor be formed in the second conductive/insulating layer.

Claims 1-20 and 27-60 are presently pending in the Application. Reconsideration of rejections is respectfully requested and an early indication of the allowability of all the claims is earnestly solicited.

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Respectfully submitted,

  
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